

Work Order ID 140816

January 19, 2016 12:59:09 PM

140816

~~U/R~~

Page 1

Item ID: D205-596-105 Accept *N900040100* Setup Start *NS1*
 Revision ID: URF 14-644 Stop *NS2*
 Item Name: Fwd Crosstube - Extended Height 31"
 Start Date: 1/19/2016 Start Qty: 1.00 *1* Cust Item ID:
 Required Date: 3/8/2016 Req'd Qty: 1.00 *1* Customer:
 Reference:

Approvals: Process Plan: SA Date: 20160119 Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr								
D205-596-105	Rev B(DEO) U/R	OK 1/16/20							

100	Document Control	0.00							
100	DOCUMENT CONTROL								
DC	Memo	0.00							
Doc.Control -USB or Paperwork	Photocopy D205-594 bluefile & type labels per PPP D205-596-105 CHG003								

105	Crosstubes Chemical Conversion	0.00							
105									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	INSIDE AND OUT								

107	QC7-Inspect Chemical Conversion Coat	0.00							
107									
QC	Memo	0.00							
Quality Control									

SMB
16/2/11

TH 16-01-20

16-1-20

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐				FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐							

Work Order ID 140816***140816***

Page 2

January 19, 2016 12:59:09 PM

Item ID: D205-596-105

Accept

N900040100Setup Start ***NS1***

Revision ID: URF 14-644

Item Name: Fwd Crosstube - Extended Height 31"

Stop ***NS2***

Start Date: 1/19/2016 Start Qty: 1.00

1

Cust Item ID:

Required Date: 3/8/2016 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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110

0.01

110

BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.01

CNC Alpha 160 Bender

Bend as per Dwg D2889 using CNC bender program

JTW 16-01-21

130

QC15- Crosstube Dimensional Check

0.00

130

QC

Memo

0.00

Quality Control

1 DAS 38 3-00

JAN 22 2016

140

0.00

140

Crosstubes

Crosstubes

Memo

0.01

Crosstubes

1-Cut as per Dwg D205-596-105

JTW 16-1-22

2-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***
Deburr & Inspect for surface damage. Polish cut surface. Scribe part # and batch
on one end of tube.

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Design	☐	Operator	☐	Bending	☐	Set-up	☐	Folio/Program	☐	Outside Dimensions	☐
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LOA	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐	Fit/Function	☐	Misread	☐
Substation	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐	Misaligned/off center	☐	Turning Sequence	☐
Past Expiry Date	☐	Manufacturing Process	☐	OTHER : _____							
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Page 3

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150		0.00							
150									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	***IMMEDIATELY AFTER GRINDING***								
	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT AS PER QSI005.								
155	QC7-Inspect Chemical Conversion Coat	0.00							
155									
QC	Memo	0.00							
Quality Control									
									DAS 41 9-89 16-1-26
160	QC5- Inspect part completeness to step on W/O	0.00							
160									
QC	Memo	0.00							
Quality Control									
									DAS 49 9-89 16-1-26

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Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
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DQA:

Date:

16.03.01

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed:

Date:

Work Order update only



Work Order: <u>140816</u> Part No. <u>D205-596-105</u> NCR No.		DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☒</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☒	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																															
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Date : <u>16/1/20</u>		Step #: <u>190</u>		QTY Effective : <u>1</u>		MRB (QSI042) Approval DAS 12 9-89 <u>16/1/20</u>																																																																	
Description Work Order Deviation <u>Install MS21920 clamps with mechanism on top (support side).</u> <u>E.C. process improvement</u>				Disposition <u>Acceptable ^{minor} deviation to reduce chance of rubber cushion deterioration.</u>				Completed By DAS 41 <u>16-2-10</u> 9-89 Lead hand / Supervisor Approval Verification DAS 9 9-89 <u>16-0224</u>																																																															
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Page 6

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N900040100

Setup Start

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Revision ID: URF 14-644

Stop ***NS2***

Item Name: Fwd Crosstube - Extended Height 31"

Start Date: 1/19/2016

Start Qty: 1.00

1

Cust Item ID:

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1

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Approvals:

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Run Start

NR1

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SPC (Y/N): _____

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Stop

NR2Sequence ID/
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DescriptionSet Up/
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Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

0.00

210

Packaging

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D205-596-105

Location: _____

PPP Rev: _____

sold

1 smB
16/2/11

220

0.00

220

QC21- Final Inspection - Work Order Release

QC

Memo

0.00

Quality Control

MLJ FEB 11 2016

MLJ FEB 11 2016

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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By _____ Lead hand / Supervisor Approval Verification _____ QC / QA Coordinator Approval _____		
Description Work Order Deviation				Disposition					
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐							
		OTHER : ☐							

Picklist Print

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Page 1

Work Order ID: 140816

140816

Parent Item: D205-596-105

D205-596-105

Parent Item Name: Fwd Crosstube - Extended Height 31"

Start Date: 1/19/2016

Required Date: 3/8/2016

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:D 05.03.21 Added bending procedureKJ/JLM
IPP Rev:E 08-01-10 ECN 1075 DD
IPP Rev F 08.04.28 Added bending & mat'l EC verified by: DD IPP rev
G 10.05.27 chg QC15 to QC6 EC verified by: DD IPP REV:H
13.11.29 as per dwg DEO B-2 DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6005-180		Manufactured	No			110	Each	34.0000	1	1			

D6005-180

Crosstube Material

★★

Location	Loc Qty	Loc Code
LG003	34	
103676	20	
75647	14	

D2893-1

Manufactured No

190

Each

5.0000

2

D2893-1

Support

★★

Location	Loc Qty	Loc Code
FG	1	
126658	1	
LG050	4	
138923	4	

MS21920-25

Purchased

No

190

Each

96.0000

4

MS21920-25

Clamp

★★

Location	Loc Qty	Loc Code
FG	10	
120920	10	
LG050	86	
M133718	7	
M133990	79	

DAS
41
9-89

16-2-8

① TW 16-01-21

16-2-8

2

4

Picklist Print

January 19, 2016 12:59:19 PM

Page 2

Work Order ID: 140816

140816

Parent Item: D205-596-105

D205-596-105

Parent Item Name: Fwd Crosstube - Extended Height 31"

Start Date: 1/19/2016

Required Date: 3/8/2016

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

190

Each

88.0000

4

4

D3595-063-450

DAS

41

~~9-89~~

16-2-8

Rubber Cushion 0.63" wide x 4.50" Long

Location

Loc Qty

Loc Code

FG

22

129907

10

131013

6

88422

6

LG052

66

138983

16

140163

50

4

PARTS LIST:

Qty	Part Number	Description
X	D205-596-105	CROSSTUBE ASSEMBLY, HI-HI FWD
1	D6005-180	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

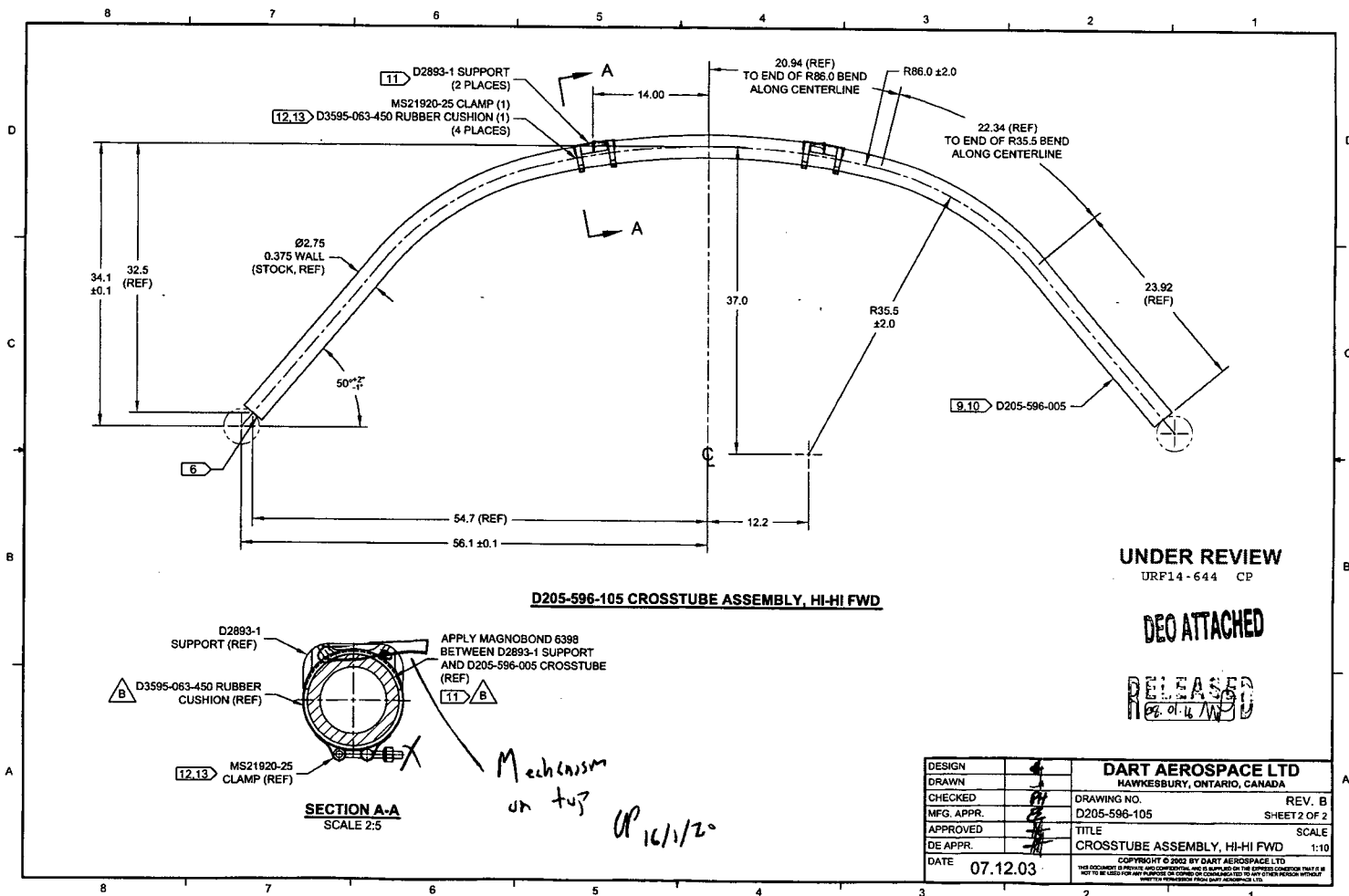
- 1) MATERIAL: MANUFACTURE FROM D6005-180
FINISHED LENGTH = 134.40 ± 0.02
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH
VIBRATING STYLUS
- 7) WEIGHT: 40 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE
- 9) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT
WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION
AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-25 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1
SUPPORT ON THE TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
NOTE: IT IS ACCEPTABLE TO SUBSTITUTE MS21920-25 CLAMPS WITH LONGER (MS21920-26) OR
SHORTER (MS21920-24) CLAMPS TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A
MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB

UNDER REVIEW

URF14-644 CP

DEO ATTACHED**RELEASED**
06-01-16

B	SUPPORT NOW MAGNOBONDED; REMOVE D2856-600-851 ABRASION STRIP; UPDATED NOTES; ADDED D3595-063-450 CUSHION; MS21920-25 WAS MS21920-24	MB	07.12.03
A	NEW ISSUE	DS	02.11.20
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>SH</i>	DART AEROSPACE LTD	
DRAWN	<i>SH</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>PH</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>PH</i>	D205-596-105	SHEET 1 OF 2
APPROVED	<i>TH</i>	TITLE	SCALE
DE APPR.	<i>TH</i>	CROSSTUBE ASSEMBLY, HI-HI FWD	NTS
DATE	07.12.03	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



UNDER REVIEW
URF14-644 CP

DEO ATTACHED

RELEASED
08.01.11

DESIGN	4	DART AEROSPACE LTD	
DRAWN	4	HAWKESBURY, ONTARIO, CANADA	
CHECKED	4	DRAWING NO.	REV. B
MFG. APPR.	4	D205-596-105	SHEET 2 OF 2
APPROVED	4	TITLE	SCALE
DE APPR.	4	CROSSTUBE ASSEMBLY, HI-HI FWD	1:10
DATE	07.12.03	COPYRIGHT © 2003 BY DART AEROSPACE LTD	
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DRAWING NO. D205-596-105	TITLE CROSSTUBE ASS'Y, HI-HI FWD	REV. B	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D205-596-105-B-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>q</i>	CHECKED <i>A.P.</i>	MFG. APPR. <i>A</i>	APPROVED <i>M.D.</i>	DE APPR. <i>M</i>			
DATE 13.11.11	DATE 13.11.19	DATE 13.11.19	DATE 13/11/21	DATE 13/11/21			

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Qty	Part Number	Description
A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
-----	----------------	---

NOTE 11 & 13, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 11) TO INSTALL D2893-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB.

RELEASED
2013-11-26
M

UNDER REVIEW

URF14-644 CP

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DRAWING NO. D205-596-105	TITLE CROSSTUBE	REV. B	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D205-596-105-B-3	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN GP	CHECKED P.P.	MFG. APPR. AA	APPROVED AE		DE APPR. H		
DATE 15.01.15	DATE 15.01.20	DATE 15.01.20	DATE 15.01.20		DATE 15.01.20		

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Qty	Part Number	Description
X	D205-596-105B	CROSSTUBE ASSEMBLY (214 HI-HI FWD)

THE D205-596-105B CROSSTUBE HAS THE SAME PARTS LIST AS THE D205-596-105 CROSSTUBE EXCEPT AS FOLLOWS:

IS:

2	D5017-1	SUPPORT
---	---------	---------

WAS:

2	D2893-1	SUPPORT
---	---------	---------

INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D205-596-105 CROSSTUBE.

RELEASED

2015 JAN 26

ECN 15-SIN GP

UNDER REVIEW

URF14-644 CP

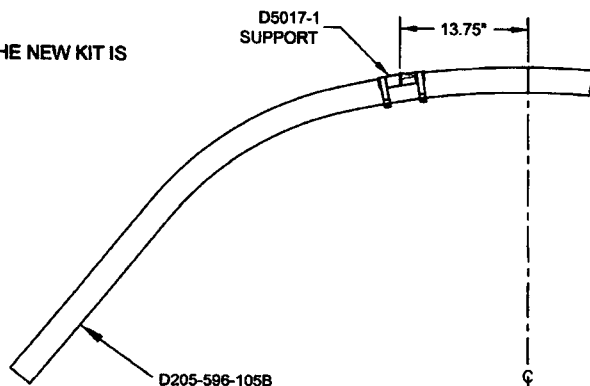
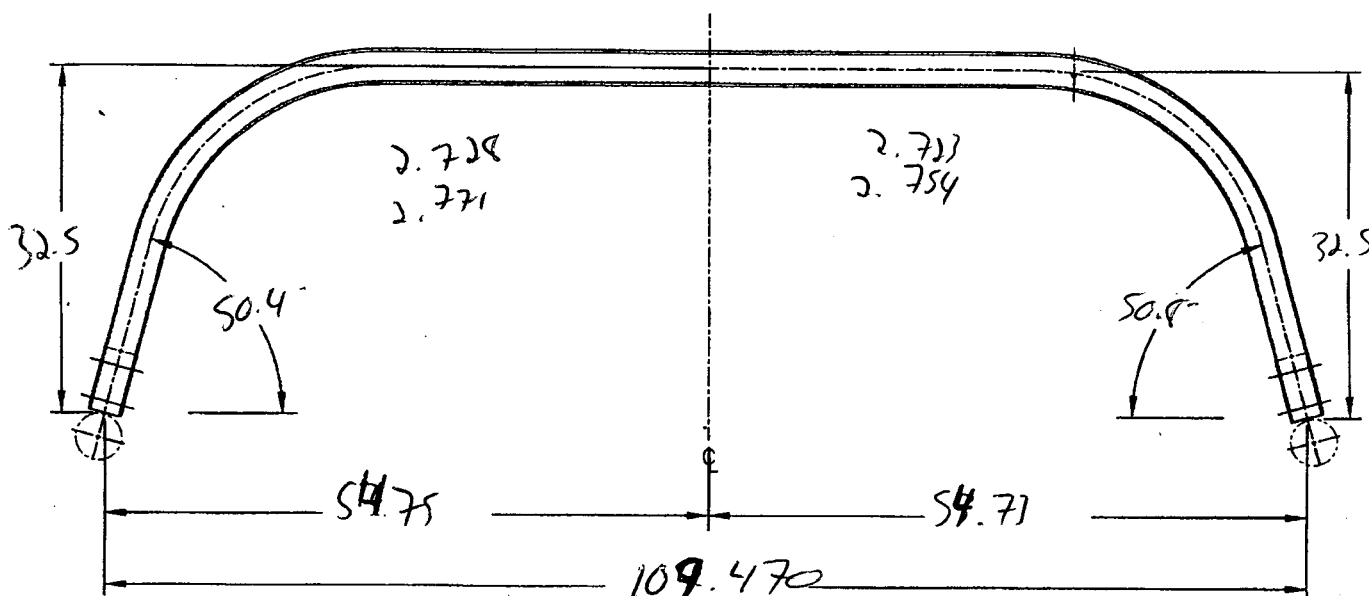


FIGURE 1 - SUPPORT INSTALLATION

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DART AEROSPACE LTD	Work Order: 190816
Description: Crosstube High-High Fwd	Part Number: D205-596-105
Inspection Dwg: D205-596-105 Rev: B	Page 1 of 1

Required Dimension	Min	Max
Height	32.4	32.6
1/2 Span	54.6	54.8
Angle	49	52
Total Span	109.2	109.6
Bending Passes	3	--
Crushing	--	6%



	Side A	Side B
Bending Passes	15	14
Crushing	0.8% 0.8%	0.5%
Comments		

DAS

38

9-89

QC15 Inspection	JAN 22 2016
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	08.04.21	Dwg Rev updated	KJ/JM	
C	12.04.16	Added bending, crushing dimensions	KJ	up